

What is claimed is:

1 1. A method for forming a drill bit body, comprising:  
2       infiltrating powdered tungsten carbide with a binder alloy in a mold, the  
3       mold having therein at least one displacement adapted to form a mounting pad for  
4       a cutting element, the displacement comprising a substantially cylindrical body  
5       having a diameter selected to substantially conform to a radius of the cutting  
6       element and a projection adapted to form a relief groove under a position of a  
7       diamond table in the cutting element when the cutting element is mounted on the  
8       pad, a width of the relief groove selected so that the relief groove extends back  
9       from an outer surface of the bit body at least about 40 percent of that portion of a  
10      thickness of the diamond table which does not extend past the outer surface.

1 2. The method as defined in claim 1 wherein the cutting element comprises a  
2 tungsten carbide substrate, the substrate brazed to the mounting pad.

1 3. The method as defined in claim 1 wherein the at least one displacement  
2 comprises a castable material formed into a single body.

1 4. The method as defined in claim 1 wherein the projection extends past an  
2 external surface of the displacement by about 0.025 inches.

- 1    5.    A drill bit body comprising:  
2         a main body having at least one blade formed therein; and  
3         at least one cutting element mounting pad formed on the at least one blade,  
4         the mounting pad adapted to receive therein a substrate of a cutting element, the  
5         mounting pad having a relief groove therein under a position of a diamond table in  
6         the cutting element when the cutting element is mounted on the pad, a width of the  
7         relief groove selected so that the relief groove extends back from an outer surface  
8         of the blade at least about 40 percent of that portion of a thickness of the diamond  
9         table which does not extend past the outer surface.
- 1    6.    The drill bit body as defined in claim 5, wherein the bit body is formed  
2         from powdered tungsten carbide infiltrated by a binder alloy.
- 1    7.    The drill bit body as defined in claim 5 wherein the relief groove has a  
2         depth of 0.025 inches.
- 1    8.    A drill bit comprising:  
2         a bit body having a plurality of blades formed therein; and  
3         a plurality of cutting elements mounted on each of the blades, each cutting  
4         element mounted on a cutting element mounting pad formed on one of the blades,  
5         the mounting pad adapted to receive therein a substrate of the cutting element, the  
6         mounting pad having a relief groove therein under a position of a diamond table in  
7         the cutting element when the cutting element is mounted on the pad, a width of the  
8         relief groove selected so that the relief groove extends back from an outer surface  
9         of the blade at least about 40 percent of that portion of a thickness of the diamond  
10        table which does not extend past the outer surface.

1    9.    The drill bit as defined in claim 8 wherein the bit body comprises powdered  
2    tungsten carbide infiltrated with a binder alloy.

1    10.   The drill bit as defined in claim 8 wherein each of the relief grooves has a  
2    depth of about 0.025 inches.

1    11.   A drill bit body comprising:  
2         a main body having at least one blade formed therein; and  
3         at least one cutting element mounting pad formed on the at least one blade,  
4         the mounting pad adapted to receive therein a substrate of a cutting element, the  
5         mounting pad having a relief groove therein under a position of a diamond table in  
6         the cutting element when the cutting element is mounted on the pad, the drill bit  
7         body formed by machining a bit body blank.

1    12.   A method for forming a drill bit body, comprising:  
2         infiltrating powdered tungsten carbide with a binder alloy in a mold, the  
3         mold having therein at least one displacement adapted to form a mounting pad for  
4         a cutting element, the displacement being made from a single component  
5         comprising a substantially cylindrical body having a diameter selected to  
6         substantially conform to a radius of the cutting element and a projection adapted to  
7         form a relief groove under a position of a diamond table in the cutting element  
8         when the cutting element is mounted on the pad.

1    13.   The method as defined in claim 12 wherein the relief groove has a depth of  
2         about 0.025 inches.

- 1 14. The method as defined in claim 12 wherein the relief groove extends back  
2 from an outer surface of the blade at least about 40 percent of that portion of a  
3 thickness of the diamond table which does not extend past the outer surface.